

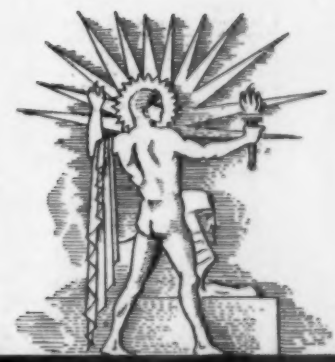
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SEP 5 1931

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



SEPTEMBER 5, 1931

The Mask of a Marauder

See Page 152

SCIENCE SERVICE PUBLICATION

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No. 543

The Weekly
Summary ofCurrent
Science

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DO YOU KNOW THAT

Ancient Babylon had houses three and four stories high.

Open flames will be employed in cooking on the new airship Akron.

The network of cables under the sea has a total length of 345,000 nautical miles.

Fish quickly desert areas where forest fires have raged because of lack of vegetation and insects.

If two lumps of sugar are rubbed together in a room that is completely dark, they will give off a faint light.

In Wisconsin there have been discovered several wet deserts: lakes fed by spring water so pure that little or no fish or plant life can thrive there.

The insect poison rotenone, which is harmless to human beings, was discovered when scientists heard that natives of the tropics used plants containing the poison to help them in catching fish.

In ancient Cyprus, copper pots were used for money.

The name quebracho, given to the world's heaviest wood, means "axe breaker."

Measurements of the aurora borealis show that these northern lights are usually not more than 100 miles above the earth.

A dinosaur's footprint recently placed on exhibit at the American Museum of Natural History is 39 inches long and almost three feet across.

Archaeologists digging in the eastern Alps found "left hands" made of iron nailed to a coffin of about 600 B.C., apparently with the idea of warding off evil spirits.

A shower of fish was vouched for by scientists in England, in 1918, when a shoal of small fish were caught in a waterspout and carried up into the air and a strong wind swept them inland, to drop them on the earth.

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Science Service presents over the radio, an address

THE ADLER PLANETARIUM AND ASTRONOMICAL MUSEUM

By Dr. Phillip Fox, Adler Planetarium, Chicago

Friday, September 11, at 2:45 P. M. Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ARCHAEOLOGY

Mysterious Maya Glyphs Are Deciphered for First Time

Pictures Accompanying Writings Aid Scientists in Making Translation of Passages from Hitherto Baffling Language

THE FIRST translations ever made from Maya hieroglyphic writing are tentatively offered by Dr. William Gates, research associate in Mayan history and language at the Johns Hopkins University.

One translation is a piece out of the "Dresden Codex," a Maya book found in Europe some years ago. The piece is a chant in honor of the four sacred "Chacs," who held up the four corners of the world in Maya myth, and whose Lord was Itzamna. Other passages are offered, too, although a key to decipherment of Maya glyphs is not specifically announced. The meanings of the passages were developed by aid of pictures accompanying the texts of the manuscript. But Dr. Gates has also succeeded in definitely translating various isolated glyphs, the first actually deciphered since scientists took up this study.

Treated as Code

Dr. Gates has treated Maya hieroglyphs as experts do code. He has tabulated all distinct glyphs found in the three ancient Maya books that survived the Spanish Conquest, grouping each symbol in all the combinations and modifications in which it appears in these ancient texts. He confined himself to these three "codices," one of which is now in Dresden, another in Paris, and the third in Madrid, because they have pictures accompanying the texts. The glyphs in these should be easier to translate than those carved on stone monuments and buildings of Maya cities in Middle America and which are not thus illustrated.

Some 2,500 distinct glyphs were found in these books, and about 100 minor glyphs. The Mayan language has a system, Dr. Gates says, and it was possible to determine that certain elements were affixed to major glyphs, modifying, classifying and describing them. It is in these affixes, Dr. Gates says, the true key to Maya writing lies.

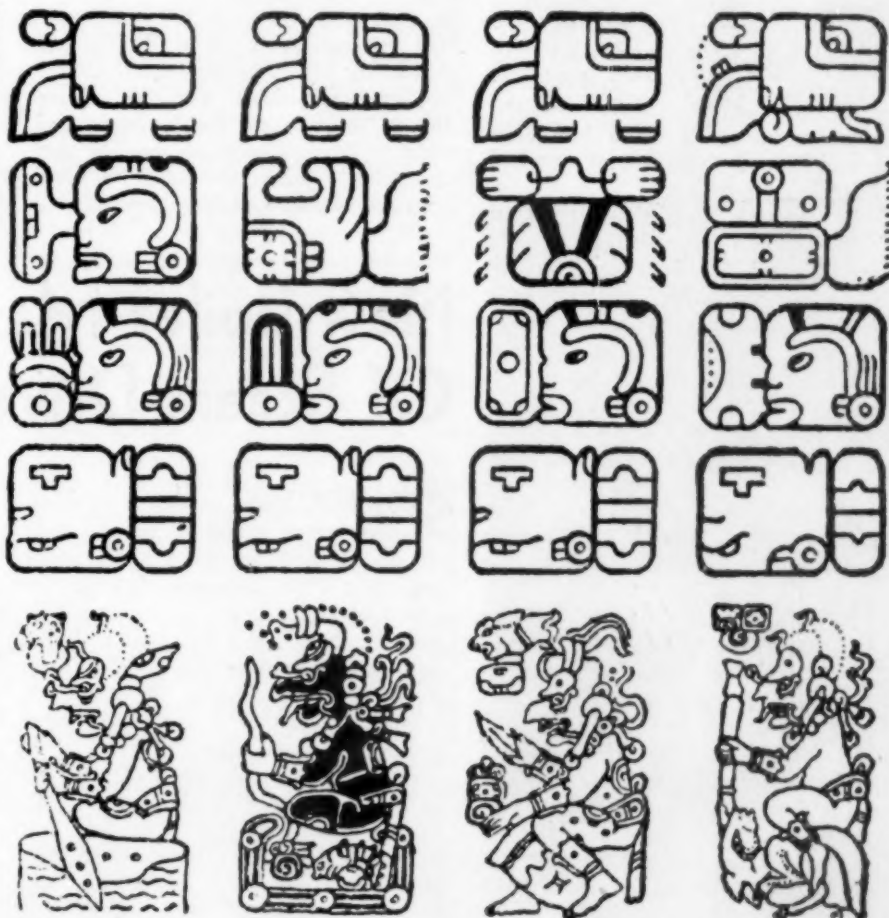
These tabulated symbols he has gathered in an "Outline Dictionary of Maya Glyphs," just published by the Maya

Society through the Johns Hopkins Press. This glyph dictionary is in reality a skeleton form on which other glyphs as identified have a place. Thus placed in order, many characteristics of the language have become apparent. Calendric and astronomical glyphs, and others relating to crop and hunting activities and the like, came out. Pairs of opposites and likes, such as earth and sky, food and drink, could be distin-

guished. Repetitions and persistent associations helped to develop many meanings brought out also by the pictures underneath.

The American Indian languages are like no others, Dr. Gates says, and the hieroglyphs too are different from those found anywhere else. The languages spoken by seven main groups of Mayas in Middle America today are related to an ancient common mother tongue as modern Italian and French are related to ancient Latin. The "Mayance" languages, as he calls them, were split from the main Maya stem about the time the modern "Romance" languages were split from the mother Latin. A study of these Mayance languages revealed that their structure and syntax were reflected in the glyphs and in the arrangement of them.

Dr. Gates is now (Please turn page)



HYMN TO THE FOUR GODS

One of the Maya glyphic inscriptions which has been deciphered by Dr. William Gates, of Johns Hopkins University. His translation, used with permission of the Maya Society, is as follows: "Do honor and sacrifice (a turkey) in the North, to the White Lord, Wise Itzamna, (at his task); Do honor and sacrifice (an iguana) in the West, to the Black Lord, Wise Itzamna, (at his task); Do honor and sacrifice (a fish) in the South, to the Yellow Lord, Wise Itzamna, (at his task); Do honor and sacrifice (a deer) in the East, to the Red Lord, Wise Itzamna, (at his task)."

ready to say that Maya writing has symbols standing for things, like nouns, and others standing for names of actions, like verbs. These latter follow the Egyptian method of expressing action, as of a man walking, or striking, or doing something. Then there are minor symbols that accompany and modify these main ones in various ways. Some appear to be adjectival, expressing such things as color. Others seem to be determinators or classifiers. Glyphs are also sometimes joined, expressing compound ideas as our word "greenwood" might.

Not Rebus Writing

The Mayan language is not rebus writing, "like Aztec," as some have said. No instance of such rebus writing has ever been found in Mayan writing. In fact, Aztec was not rebus writing either, but picture writing, Dr. Gates explained, although some of the pictures were already partially abbreviated and conventionalized. The Mayan writing had gone further than Aztec. The original pictures had long been "worn out," and had become "ideographs." Probably before America had been discovered, the original meanings of these had been lost, and "ideas" had become attached to them by convention.

It is frequently stated that the Mayan writing had "already become partly phonetic," and that for that reason it would never be possible to decipher it without some written key which it was hoped some thoughtful Christian priest had hidden somewhere not yet discovered. But Dr. Gates has shown that Maya, like Egyptian and Chinese, had not yet reached a phonetic stage. That is a late stage in written language, although these other great races in the past have been able to develop a high degree of culture without feeling the necessity of a phonetic science.

"We can now read and calculate Maya dates," Dr. Gates says, "but not another single thing, aside from the several glyphs known since the sixteenth century and the few identified by myself. About one-third of the thousands of written and carved symbols in codices and inscriptions happen to be numerals, or time-period signs. This has led to the absurd statements that we can now read one-third of the Maya glyphs, and are approaching a decipherment."

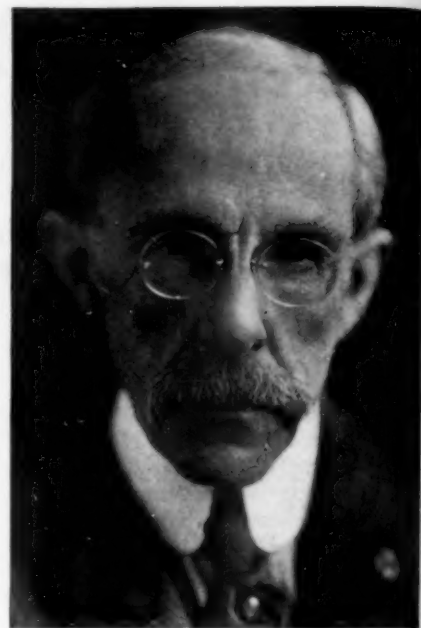
"The truth is that we cannot even read the date glyphs," Dr. Gates asserts. "We can only calculate with them, and that merely because of accompanying dots and bars whose value was told to us by early Christian missionaries. We have no idea what the actual glyphs

themselves really mean, and we know nothing of the symbolism in which they are wrapped."

The glyph "dictionary," he states, is the beginning of a systematic study of the elements of Maya writing, by which a final decipherment of Maya texts may be hoped for. Maya glyphs have never been systematically collected and classified before. The present "dictionary" is a skeleton form to which other glyphs must be added as found and classified.

By this systematic study of the three Maya codices, Dr. Gates has been able to divide these books into "chapters," according to subject matter. He has found what he claims as the proper order of reading these ancient manuscripts, and their "book make-up."

"In seeking to solve Maya writing," Dr. Gates says, "the student must keep before him a mental picture of the Indian as he looks out on the world. His world is not a world of books. His language is not one of spellings and letters, but of words as wholes with meanings and not with letters. In the old days in the big cities the Mayan spoken languages sometimes rose to exalted literary heights and the language had many delicate shades of thought and suggestion. But it was always a vivid language, and had a straight-eye view of



DR. WILLIAM GATES

The American Scientist who has made a beginning on the translation of Maya glyphs, more enigmatic even than the old Egyptian picture-writing.

things and actions. It was not lost in meaningless forms of the dictionary and grammar."

Science News Letter, September 5, 1931

INVENTION

New Boiler May Bring Return Of Steam-Driven Automobile

STEAM-DRIVEN motor vehicles, fairly numerous on the roads a couple of decades ago, may again come into their own, and possibly even be joined by steam-driven planes and dirigibles in the air, if a new type of light-steam boiler invented by C. E. Bishop of Mitchellville, Iowa, meets future tests as successfully as it has met those encountered in the past.

A difficulty which steam-driven vehicles have always had to face, Mr. Bishop says, arose from the fact that most of the types of boiler were built of a single long coil of tubing, and this tube heated to redness in one or more spots, necessitating frequent and expensive replacements.

The new boiler makes use of a number of shorter coils, each of which opens at top and bottom into a surrounding water-cage made of larger tubing, which serves as the main water

reservoir. The boiling of the water keeps it in active circulation, entering the water-cage at the top and returning to the coils at the bottom. The steam is given off from the heated water at the top of the water cage, and passes into a series of larger tubes which serve as steam collectors and also bring it again into contact with the fire, super-heating it and making it thoroughly dry. Before reaching the engine, the steam is subjected twice to this re-heating process.

The inventor states that his system has aroused interest on the part of interests outside the vehicle field, which have need for a light boiler capable of raising a supply of dry steam in a hurry. He is not yet ready, however, to undertake its commercial exploitation. Before he offers it to the vehicle and transportation industries he wants to develop a steam motor suitable for use with it.

Science News Letter, September 5, 1931

GEOLOGY

Scientist Predicts Return Of Great Glaciers in 2000 Years

Evidence Points to Southward Movement of Deciduous Forests Which Marks Present Period as Interglacial

A RETURN of the great glaciers in 2,000 years or thereabouts is a reasonable expectation, according to Dr. O. Gunnar Erdtman of the University of Stockholm. Dr. Erdtman, who recently lectured at the University of Michigan en route from Alberta to Sweden, bases this statement on a comparison of the postglacial forest history of northern Europe with the forest histories of interglacial periods.

The course of forest history is traced by means of the microscopic fossil pollen deposited by wind in lakes and bogs, where it is preserved in sediment or peat. If the various layers of this material are removed in order and studied, the composition of the local forests at successive times can be ascertained. The kinds of tree pollen and their relative abundance furnish the clue.

An interglacial period is marked by the retreat northward of coniferous forests of fir, spruce and pine. This is accompanied by the development of a warm, generally dry climate and the advance of deciduous forests of oak, beech, etc., from the south. After a time these deciduous forests retreat southward, followed by the conifers, whose shift presages the return of ice.

Climate More Humid

The evidence so far secured by Dr. Erdtman in Scandinavia and the British Isles strongly suggests that a southward movement of the forests is under way. Certainly it is known to scientists in both Europe and America that the present climate is more humid, and probably cooler than was that of a few thousand years ago. It is also known that deciduous forests were more extensive in southeastern Canada a few thousand years ago than they are today. On the basis of such facts it may not be unreasonable to regard the present period as properly interglacial rather than postglacial. Such a possibility is often mentioned by geologists on other grounds.

Dr. Erdtman has just completed several months as guest of the University of Alberta at Edmonton. During this

time he made extensive studies of the pollen being deposited today in the muskeags and lakes of the northern interior, to see how accurate a picture it presents of the existing forest. In this way it is hoped to learn how much dependence may be placed upon fossil pollen as an index to forests of the past. Dr. Erdtman has found the problem complicated by the fact that certain very abundant trees such as aspen and poplar have pollen which is not preserved. This is not likely to affect the general conclusions reached in Europe, however.

Science News Letter, September 5, 1931

ASTRONOMY

Exploding Prominence Photographed at Yerkes

By DR. E. B. FROST,

Director, Yerkes Observatory

THIS IS an unusual polar eruption photographed with the Rumford spectroheliograph of the Yerkes Observatory on August 6, by Dr. Edison Pettit of the Mount Wilson Observatory. The prominence had been observed repeatedly on August 3, 4 and 5, as it was passing around the western edge of the sun. On the morning of the sixth the prominence "blew up" and reached a height of 385,000 miles. At the stage shown in the picture the height was 290,000 miles. This picture was one of the 76 exposures made on that day.

Dr. Pettit is especially interested in the study of the sudden changes in the velocity of the outflow of calcium vapor, which occur as impulses without acceleration of the gaseous mass. They were investigated by him in the famous eruptive prominence of May 29, 1919.

During the period of the greatest activity of this eruptive prominence on August 6, exposures were made at intervals of about every three minutes. Meanwhile visual observations of the prominence were made by several observers with the spectrohelioscope, with the use of the scarlet line of hydrogen, known as Fraunhofer's C, in order to

note any marked differences between the appearance in calcium vapor (H line) and the hydrogen vapor.

During the summers of 1930 and 1931, Dr. Pettit spent a few weeks at the Yerkes Observatory in order to take advantage of the good conditions for solar work usually prevailing during this season.

Science News Letter, September 5, 1931

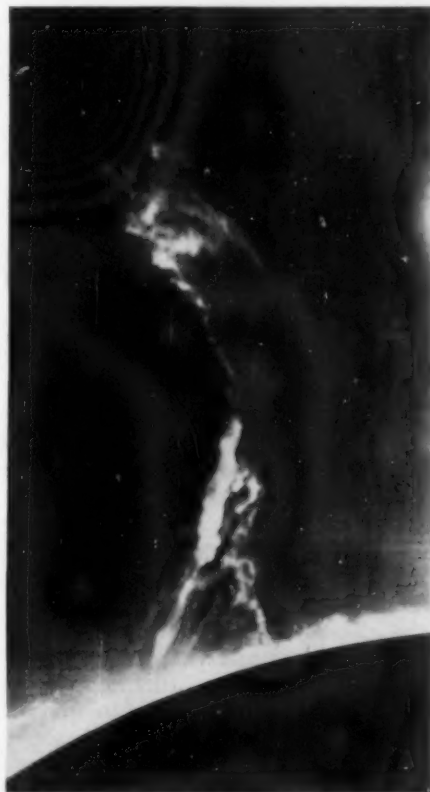
ENTOMOLOGY

Cockroaches Want it Cool If Surrounding Air is Dry

A N APPARATUS that measures temperatures preferred by cockroaches shows that the drier they are the cooler they like to be. In moist air they are content to be a little warmer.

Cockroaches lose about nine per cent. of their body weight a day, when they are in dry air at 86 degrees Fahrenheit. In four days they die. D. L. Gunn, zoologist at the University of Birmingham, has made these experiments. A German scientist found that beetles react in a similar way.

Science News Letter, September 5, 1931



THIRD OF A MILLION

Such is the approximate number in miles of the height of the erupted solar prominence when this photograph was taken at the Yerkes Observatory on August 6. Seventy-six exposures were made that day.

ASTRONOMY

Shadows in Space

Eclipses This Month of Sun and Moon Are Visible Only From Abroad While a Star Occultation Can be Seen at Home

By JAMES STOKLEY

THOUGH two eclipses, one of the sun, the other of the moon, form the features of the celestial program for the month of September, an American who wants to see them will have to do some travelling. Not until next year, on the 31st of August, will he be able to see a solar eclipse at home, while the next lunar eclipse visible from the United States is even later. But, in addition, September brings the first occultation, or eclipse, of a naked eye star in some months, an event which can be watched from this country.

The solar eclipse occurs on the afternoon of September 11. As always, this is due to the shadow of the moon, cast by the sun, sweeping across the earth, but only the outer part of the shadow touches our planet. If all the brightness of the sun were concentrated in a point, instead of being spread out over an area half a degree in diameter, the moon's shadow would be sharply defined. One point, on the side of the moon away from the sun, might be in the shade, another, a short distance away, might be exposed to the full solar glare. But the sun is much closer than any of the other stars, so unlike them it presents a disc, and not a point of light. Consequently the moon's shadow is divided into two parts. If, with some inter-planetary rocket craft of the future, you were to travel around the moon at a distance of 240,000 miles, approximately that of the earth, you would see the sun unobscured most of the time. Then you would come, perhaps, to a place where your position, the edge of the moon, and the opposite edge of the sun were directly in line. As you travelled a little farther, the moon would begin to come in front of the sun. This would be a partial eclipse, and you would be in the outer part of the shadow, what is called the penumbra. Suppose that you went still farther. More and more of the sun would be obscured, but still a little would be seen, until you reached the inner part of the shadow. As you got to this point, your

ship, one edge of the moon and the same edge of the sun would all be in line. You would go still farther and none of the sun would appear, you would be in the inner part of the shadow—the umbra—and the sun would be in total eclipse.

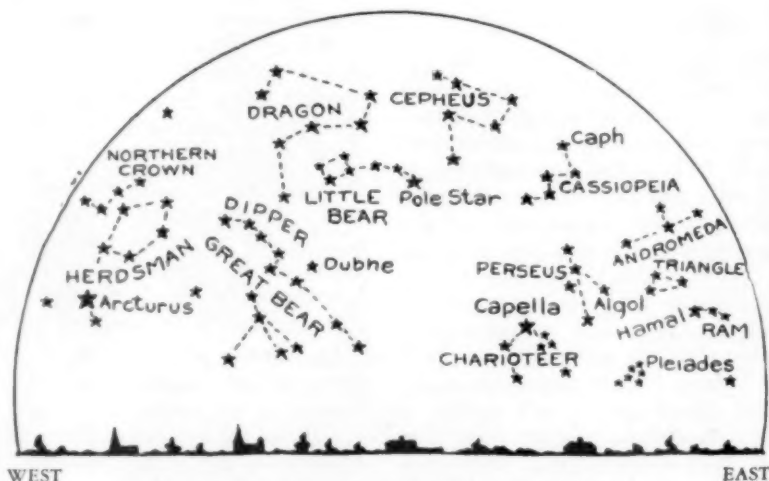
In order to have a total eclipse, therefore, the moon's umbra must reach the surface of the earth, for as yet we have no such rocket ships to chase eclipses all around the universe. When a total eclipse does occur, as is the case during next August, the umbra only reaches a small part of the earth.

Engulfed in Penumbra

All around it is a region engulfed in the penumbra, so every total eclipse is accompanied by a partial eclipse over a much larger area. But sometimes just the penumbra touches earth, and the umbra misses it completely. Then we have a partial eclipse without a total—the condition occurring on September 11. When this happens, the penumbra touches somewhere in the polar regions. This month it includes Alaska, Bering Strait and East Cape. Even where the sun is obscured to its maximum extent, the moon will extend over only a twentieth of its diameter.

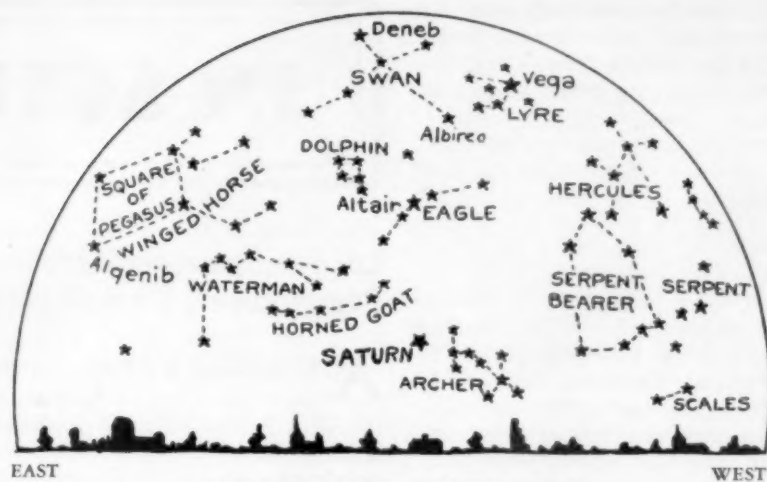
This is so slight that people in Alaska will not notice any diminution in the brightness of the sunlight. Only by looking at the sun, through smoked glass, will they be able to see a tiny section apparently bitten out of it. Such an eclipse has no scientific importance whatever, and no astronomical expeditions will observe it. Even if an astronomer happened to be there at the time, he would probably give it no more than a passing glance.

The eclipse of the moon is a little better in one respect, for at least it is total. Just as the moon casts a shadow out into space on the side away from the sun, so does the earth cast a similar shadow. The earth's shadow also contains the inner umbra and the outer penumbra. And just as the earth sometimes enters the moon's shadow, so does the moon occasionally wander into the shadow of the earth. But there is one important difference. The earth is 7,900 miles in diameter, as compared with the moon's 2,200 miles, so our shadow is much bigger. Thus, the moon's shadow can never fall on more than a small fraction of the earth's surface, but the earth's shadow can, and does, completely engulf the moon. This happens on September 26, and at any part of the earth where the moon has risen, the eclipse will be visible. Even in eclipse, the moon can usually be seen, because the atmosphere of the earth bends a little sunlight around into the shadow,



NORTHERN SKIES DURING SEPTEMBER

Here are found two bright stars, Arcturus in the west and Capella near the northeastern horizon. In addition, there are such familiar figures as the Great and Little Bears, the Dipper, and the Pole Star.



VEGA IS MOST CONSPICUOUS

Of the stars to be seen this month, its position will be almost overhead. Just east of Vega in the southern heavens is the constellation of the Swan, sometimes called the northern cross. Deneb is at the head of the cross and Albireo marks the foot.

which has the effect of illuminating the moon with a ruddy glow.

As it must always be when eclipsed, the moon is full on the night of the 26th, and so it rises at sunset, or 5.48 P. M., local time. Unfortunately for would-be eclipse observers, the total eclipse ends at 3:30 P. M., Eastern standard time. That is the moment when the moon begins to emerge from the umbra. At 4:41 P. M., Eastern standard time, it has withdrawn from the umbra completely. At 5:55 P. M., Eastern standard time, it completely leaves the penumbra, and the eclipse is entirely over. Thus, in the eastern part of the country, for a few minutes after moonrise, the moon will still be very slightly eclipsed, but it will be so slight that no instruments could detect the diminution in its light. Only where the total eclipse can be seen will anything of interest be noted. This area will include, for the beginning, the western Pacific Ocean, Asia, Australia, the Indian Ocean Europe and all of Africa but the northwestern part. The ending will be visible in all but the eastern part of this area, and, in addition, the Atlantic Ocean and the eastern part of South America. But though a lunar eclipse is of considerable interest as a spectacle, it, also, is of little scientific value, and no expeditions are being made to observe it. However, established observatories that can see it will possibly make routine observations to check up the times of the different parts of the eclipse.

The remaining event, that can be witnessed from the United States, is an occultation. Besides occasionally coming between the earth and the sun, the

moon can also come between us and a star. This is called an occultation. Because there are so many more stars than the sun, occultations are much more common than eclipses, but most are of faint stars, visible only in a telescope. On September 4, at 1:07 A. M., eastern standard time, the moon comes in front of the star 27 Tauri. This is one of the fainter stars in the constellation of Taurus, the bull, characterized by the red Aldebaran, which shines in the eastern sky in the early morning hours. 27 Tauri is of the 3.7 magnitude. Though this is well above the usual limit of naked eye visibility, the fact that it is so close to the moon, then just before last quarter, will make it rather difficult to see. A small telescope, or even a good pair of binoculars, or opera glasses, will aid considerably in revealing the star. The bright edge of the moon will approach the star, suddenly covering it, when the star will do a disappearing act completely and precisely on the instant.

Moon Lacks Atmosphere

Nearly an hour later, at 2:05 A. M., eastern standard time, the moon will have passed on and the star will reappear, from behind the dark edge of the moon. This is particularly interesting to watch, for no star will be seen up to the moment of emergence, then instantaneously it will be visible, shining with full brilliancy. Such an observation is a good proof that the moon lacks an atmosphere. Were there a layer of air around our satellite, as there is around the earth, the star's light would shine through an increasingly

thin layer of gas, and the light would reappear gradually.

Such occultations are regularly observed by observatories, because they afford an excellent means of checking the moon's position. So numerous are the influences which pull the moon, first one way, then another, that exact prediction of its motions is one of the most difficult problems of modern astronomy. This makes a constant check necessary on its positions, to detect possible errors. Because the positions of the stars are known with great precision, and the abruptness of an occultation gives a very definite time to measure, occultations are of great value. Sometimes, also, it is possible to tell something about a star from an occultation. Very rare observations have been made when a star did not reappear as suddenly as expected, but took an appreciable fraction of a second to reach maximum brightness. This is not due to any lunar atmosphere, but to the star's diameter being so large that it takes the moon a fraction of a second to traverse it. But most of the stars are so nearly single points of light, that this effect is seldom seen. Recently, however, a South American astronomer, Dr. B. H. Dawson, noticed that when a star called sigma Scorpii reappeared after an occultation, there were two appreciable steps. This was probably due to the two parts of the star reappearing separately. This star is known to be a spectroscopic binary. That is, it consists of two separate spheres, each revolving around the other, but so close that even the most powerful telescope is too feeble to separate them. Only by studying its light in the spectroscope are astronomers able to detect its duplicity, except by means of an occultation.

Most conspicuous of the stars to be seen this month, is Vega, nearly overhead and marking the group of Lyra, the lyre. Just east of Vega, though considerably fainter, is Deneb, marking Cygnus, the swan. This constellation is also known as the northern cross. The bottom of the cross points to the southwest, and Deneb is at the head. The star Albireo, still fainter, marks the foot. Just south of Cygnus is the bright star Altair, more brilliant than Deneb, though inferior to Vega. Altair is in the group of Aquila, the eagle. Two other bright stars, exceeded only by Vega among those now visible, are to be seen in the northeast and in the west, but the fact that they are very low in the sky reduces their brilliance. In the west, a little to the north, is Arcturus, in Bootes; (Turn to page 156)

ENTOMOLOGY

**Seeing Eye to Eye
With a White Wasp**

See front cover

THE medieval Japanese, who sometimes closed up the fronts of their helmets with ferocious metal masks painted with vivid war-paint, knew the right psychology for hand-to-hand encounters. It is much more disconcerting to be confronted with an immobile, wholly artificial hobgoblin face than to see that your enemy's countenance is like your own, no matter how much distorted by rage or bloodthirstiness.

The faces of insects are masks. Because the whole arthropod phylum has evolved its skeleton outside its body, to be at once support and armor, insects are able to move parts of their faces only in rigid, hinged sections; and that, from an anthropopsychic point of view, is not much of an advantage. Some insects make themselves "harder to look at" by wearing vividly contrasting war-paint—for example, this white-faced wasp photographed by Cornelia Clarke.

Science News Letter, September 5, 1931

ZOOLOGY

**Russian May Have Perished
Seeking Caucasian Bison**

A RUSSIAN zoologist, M. Schaposnikov, is believed to have perished in a search for possible survivors of the once large herd of wisent, or old-world bison, that ranged in the wild fastnesses of the Caucasus in pre-war days. They were the property of the Russian grand dukes, and Schaposnikov was superintendent of the timber reserves in which they lived. The herd once numbered well over a thousand head, but during the war and the anarchic days that followed the hard-pressed people of the region killed them for food, and probably wiped out the very last animal.

However, rumors of a few survivors have persisted. Early this year, Schaposnikov wrote to E. W. Pfizenmeyer in Stuttgart, formerly Custos of the Caucasian Museum in Tiflis stating that there were specimens of the animals in a remote part of the Caucasus. A later letter stated that he intended to go in person to investigate the matter. After a lapse of several months, Herr Pfizenmeyer has received a letter from Schaposnikov's wife, stating that no word whatever had been received from her husband for nearly half a year, and that she believed he had been killed by

bandits. There was no word about the wisent remnant; it is thought highly probable that Schaposnikov's sacrifice was made vainly, on behalf of animals that are no longer there.

The wiping out of the Caucasus herd, and the similar extinction of the herd that once lived in the woods of the old Baltic provinces of pre-war Russia, leave only zoo specimens of the wisent to carry on the losing struggle for survival. At the beginning of the present year, the whole number of pure-blooded wisent in all the zoological gardens of Europe was 61. Thirty-two cows and 29 bulls, including six calves of 1930, made up the count. During 1931, one bull calf and two heifers were born; but one of the heifers died.

Science News Letter, September 5, 1931

ETHNOLOGY

**Incan Hymns Resemble
Biblical Appeals to God**

ELOQUENT hymns to a creator god, long ago composed by Incas of Peru, puzzlingly resemble some of the Old Testament passages addressed to Jehovah. That the similarity of thought is due to "an approximate likeness in mental culture between the folk of ancient Palestine and the folk of ancient Peru" is the explanation offered by Philip Ainsworth Means.

One prayer to the Peruvian creator god Pachacamac, showing the philosophic heights to which the Incan mind attained, is as follows:

"O Pachacamac! Thou who hast existed from the beginning, Thou who shalt exist until the end, powerful but merciful, who didst create man by saying, 'Let man be,' who defendest us from evil, and preservest our life and our health, art Thou in the sky or upon the earth? In the clouds or in the deeps? Hear the voice of him who implores Thee, and grant him his petitions. Give us life everlasting, preserve us and accept this our sacrifice."

Some writers have held that the religious poems of this type composed by the Incas must have taken their present form after the Incas were in contact with Spanish priests and Bibles, Mr. Means explains. But opposing this view, he argues that many Catholic missionaries who flocked to Peru after the Conquest left writings showing that they had found evidences of the exalted spirituality already existing in the people, and that they used it in their efforts to convert the people to Christianity.

*Science News Letter, September 5, 1931***IN SCIENCE**

ORNITHOLOGY

**London Sparrows Have
Begun Losing Their Tails**

A STRANGE degeneracy has overtaken the London sparrow since the World War. His tail feathers are breaking off at the roots, sometimes so closely that the quills appear to have been pulled out. But the middle feathers leave stumps a little longer, so that the damaged tail has a rounded appearance. The normal feathered tail, however, is slightly forked. The birds do not seem otherwise degenerate. Whatever the cause, it acts on males and females alike, and swiftly, for one does not see partly broken tails.

Before the World War, Londoners remember sparrows appeared with white feathers in their tails. These disappeared for a few years, but have returned.

Science News Letter, September 5, 1931

RADIO

**"Boutonniere" Microphone
Gives Speaker Freedom**

A MICROPHONE so small that it can be hung on a speaker's coat lapel or even be hidden in his vest pocket has been developed for the Western Electric Company by engineers of the Bell Telephone Laboratories.

The miniature "mike" is designed to take the place of the present array of fixed microphones that line the front of the speaking platform at every notable occasion. It can be used either in radio transmission or with public address amplifying systems. One speaker has already used this microphone hiding it in his pocket and running an invisible cord down a trousers' leg. A long pair of flexible conductors permits freedom of the stage.

The instrument is in reality a new type of telephone transmitter which is just coming into use by switchboard operators, placed in a mounting for mechanical protection. To cut down the rumble of a speaker's chest sounds, a circuit containing an electric filter arranged to give a pleasing balance of sound is provided.

Science News Letter, September 5, 1931

SCIENCE FIELDS

ARCHAEOLOGY

Pennsylvania Museum to Dig Again in Mesopotamia

THE MUSEUM of the University of Pennsylvania and the American Schools of Oriental Research plan to resume archaeological work at Tell-Billah in Mesopotamia, the expedition again to be directed by Dr. Ephraim A. Speiser.

Dr. Speiser sailed for Leiden, Holland, on August 26 as a delegate to the eighteenth international Congress of Orientalists, where he will represent the United States Government, the University of Pennsylvania, and five other scientific institutions. He will present a paper on "The Ethnic Problems of Mesopotamia."

Immediately following the close of the congress Dr. Speiser will leave for Syria, where he will join the eight other scientists forming his staff. The entire group will then cross the desert to Damascus and proceed to their camp near Mosul, which will serve as the base of the operations during the season of 1931-32.

Science News Letter, September 5, 1931

METEOROLOGY-ENGINEERING

Akron to Use Radio "Feelers" for Air Testing

WHEN THE NAVY'S new monster dirigible "Akron," settles toward a landing field obscured by fog or cloud, she will not have to "go it blind," but will drop a radio-equipped "feeler" that will signal back to an automatically registering apparatus the atmospheric conditions in the unseen air levels below.

The instrument was invented by a Russian scientist, Prof. Moltschanov. It was designed originally for use in an entirely opposite direction, namely for sending aloft attached to small drifting balloons, to obtain meteorological information at high altitudes. It was intended especially for use in the Arctic and other unpopulated regions, where the ordinary meteorographic balloons, which depend on being picked up and sent back to headquarters by farmers

and woodsmen, would of course be useless. It carries instruments to measure temperature, air pressure and atmospheric moisture, and an automatic radio sending apparatus, whose signals are picked up and recorded on a revolving drum by the receiving apparatus.

The Navy has ordered two of Prof. Moltschanov's sets, and expects to have them in use in a few months. In practice, the sending set will be dropped from the "Akron" on a long cable, to "feel out" atmospheric conditions underneath, and inform the navigating officers whether there is clear air under a given cloud surface, or whether there is solid fog to the ground.

Although there will always be a solid connection between the "Akron" and the sending set, the atmospheric data will still be transmitted by radio, because it is simpler to handle it that way than to make electrical connections and receive the data up the suspending wire.

Science News Letter, September 5, 1931

GAME RESERVES

New Game Reserves Protect Dwindling African Herds

TWO new game reserves in South Africa have been established by the Parliament of the South African Union.

The largest of these lies between the Aub and Nossob rivers in northwestern South Africa, formerly German Southwest Africa, and has an area of about 1,800,000 acres. Here the gemsbok or oryx, entirely exterminated in other parts of South Africa, still lives in large herds; and there are other kinds of antelopes including koodoos, elands and gnus or hartebeests, as well as lions and leopards and rare birds.

The second reserve is called the Addo reserve. It has an area of over 11,000 acres and lies in the eastern part of the Union. It is the last refuge for a few of the South African elephants, which are much smaller than those of Central Africa.

There are 40 of these now on the reserve, and the government has taken care to provide sufficient watering places for them. Lack of water has been one of the causes of their extinction in numerous other places.

These new reserves are cared for by the South African National Park department, which also administers the Kruger National Park, this latter being perhaps the greatest game reserve in the entire world.

Science News Letter, September 5, 1931

METEOROLOGY

Rain, Not 1930 Drought, Cause of Abnormal Crops

FARMERS who believe that last year's drought affected soil chemically to improve it for this year's crop are mistaken, according to J. B. Kincer, of the U. S. Weather Bureau.

"Abnormal crop growth this year is due entirely to contemporary weather conditions," he said, "and in no way may be attributed to improvement of soil conditions."

The summer, particularly the month of July, has been unusually warm, and rainfall has been above normal in Atlantic seaboard and southern states, it was explained. Under such conditions, all vegetal matter grows rapidly.

The fact that disproves the theory that soil is chemically changed may be brought out by comparing eastern and southern state crop conditions to those in the corn belt, through the north and northwest.

In the belt the drought was just as severe as in the east, yet subnormal rainfall has caused crops to be considerably below normal.

Plenty of heat, coupled with constant moisture due to opportune rainfall, are the causes for abnormal crop growth.

Science News Letter, September 5, 1931

BOTANY-MEDICINE

Brazilian Wood Causes Skin Poisoning Like Ivy

CASES of skin poisoning among woodworkers, similar in many respects to the effects of poison ivy or poison oak, have been investigated by the U. S. Public Health Service, which has just reported its findings.

The trouble has been due to a hardwood imported from Brazil. In its native land, the wood is known as "em-buia"; in America it is given the trade name of Brazilian walnut, though it is not a true walnut but a relative of the laurel. It is highly prized as a material for fine woodwork in Brazil.

"Patch tests" given by applying sawdust from the wood to selected skin areas on human volunteers definitely determined its guilt. Not all persons are susceptible, however, and susceptible persons often acquire immunity.

During the war, Brazilian walnut was imported to some extent for use in gunstocks, but as far as is known no trouble was reported at that time.

Science News Letter, September 5, 1931

PHYSICS

Joseph Henry on Electrical Induction

"A Classic of Science"

The American Scientist Shares Faraday's Centenary as Discoverer of Electric Currents Induced by Magnetism

ON THE PRODUCTION OF CURRENTS AND SPARKS OF ELECTRICITY FROM MAGNETISM; By Prof. J. Henry. In *American Journal of Science*, Vol. XXII, 1832.

ALTHOUGH the discoveries of Oersted, Arago, Faraday, and others, have placed the intimate connection of electricity and magnetism in a most striking point of view, and although the theory of Ampere has referred all the phenomena of both these departments of science to the same general laws, yet until lately one thing remained to be proved by experiment, in order more fully to establish their identity; namely, the possibility of producing electrical effects from magnetism. It is well known that surprising magnetic results can readily be obtained from electricity, and at first sight it might be supposed that electrical effects could with equal facility be produced from magnetism; but such has not been found to be the case, for although the experiment has often been attempted, it has nearly as often failed.

Possess Other Properties

It early occurred to me, that if galvanic magnets, on my plan, were substituted for ordinary magnets, in researches of this kind, more success might be expected. Besides their great power, these magnets possess other properties, which render them important instruments in the hands of the experimenter; their polarity can be instantaneously reversed, and their magnetism suddenly destroyed or called into full action, according as the occasion may require. With this view, I commenced, last August, the construction of a much larger galvanic magnet than, to my knowledge, had before been attempted, and also made preparations for a series of experiments with it on a large scale, in reference to the production of electricity from magnetism. I was, however, at that time, accidentally interrupted in the prosecution of these ex-

periments, and have not been able since to resume them, until within the last few weeks, and then on a much smaller scale than was at first intended. In the mean time, it has been announced in the 117th number of the Library of Useful Knowledge, that the result so much sought after has at length been found by Mr. Faraday of the Royal Institution. It states that he has established the general fact, that when a piece of metal is moved in any direction, in front of a magnetic pole, electrical currents are developed in the metal, which pass in a direction at right angles to its own motion, and also that the application of this principle affords a complete and satisfactory explanation of the phenomena of magnetic rotation. No detail is given of the experiments, and it is somewhat surprising that results so interesting, and which certainly form a new era in the history of electricity and magnetism, should not have been more fully described before this time in some of the English publications; the only mention I have found of them is the following short account from the *Annals of Philosophy* for April, under the head of Proceedings of the Royal Institution.

"Feb. 17.—Mr. Faraday gave an account of the first two parts of his researches in electricity; namely, Volta-electric induction and magneto-electric induction. If two wires, A and B, be placed side by side, but not in contact, and a Voltaic current be passed through A, there is instantly a current produced by induction in B, in the opposite direction. Although the principal current in A be continued, still the secondary current in B is not found to accompany it, for it ceases after the first moment, but when the principal current is stopped then there is a second current produced in B, in the opposite direction to that of the first produced by the inductive action, or in the same direction as that of the principal current.

"If a wire, connected at both extremities with a galvanometer, be coiled

in the form of a helix around a magnet, no current of electricity takes place in it. This is an experiment which has been made by various persons hundreds of times, in the hope of evolving electricity from magnetism, and as in other cases in which the wishes of the experimenter and the facts are opposed to each other, has given rise to very conflicting conclusions. But if the magnet be withdrawn from or introduced into such a helix, a current of electricity is produced *whilst the magnet is in motion*, and is rendered evident by the deflection of the galvanometer. If a single wire be passed by a magnetic-pole, a current of electricity is induced through it which can be rendered sensible."

Without Previous Knowledge

Before having any knowledge of the method given in the above account, I had succeeded in producing electrical effects in the following manner, which differs from that employed by Mr. Faraday, and which appears to me to develop some new and interesting facts. A piece of copper wire, about thirty feet long and covered with elastic varnish, was closely coiled around the middle of the soft iron armature of the galvanic magnet, described in Vol. XIX of the *American Journal of Science*, and which, when excited, will readily sustain between six hundred and seven hundred pounds. The wire was wound upon itself so as to occupy only about one inch of the length of the armature which is seven inches in all. The armature, thus furnished with the wire,

The Ancient Monuments of the Mississippi Valley

Studied by E. G. Squier and E. H. Davis, whose account was published as the first of the Smithsonian contributions to knowledge

is the subject of

THE NEXT CLASSIC OF SCIENCE

was placed in its proper position across the ends of the galvanic magnet, and there fastened so that no motion could take place. The two projecting ends of the helix were dipped into two cups of mercury, and there connected with a distant galvanometer by means of two copper wires, each about forty feet long. This arrangement being completed, I stationed myself near the galvanometer and directed an assistant at a given word to immerse suddenly, in a vessel of dilute acid, the galvanic battery attached to the magnet. At the instant of immersion, the north end of the needle was deflected 30° to the west, indicating a current of electricity from the helix surrounding the armature. The effect, however, appeared only as a single impulse, for the needle, after a few oscillations, resumed its former undisturbed position in the magnetic meridian, although the galvanic action of the battery, and consequently the magnetic power was still continued. I was, however, much surprised to see the needle suddenly deflected from a state of rest to about 20° to the east, or in a contrary direction when the battery was withdrawn from the acid, and again deflected to the west when it was reimmersed. This operation was repeated many times in succession, and uniformly with the same result, the armature, the whole time, remaining immovably attached to the poles of the magnet, no motion being required to produce the effect, as it appeared to take place only in consequence of the instantaneous development of the magnetic action in one, and the sudden cessation of it in the other.

This experiment illustrates most strikingly the reciprocal action of the two principles of electricity and magnetism, if indeed it does not establish their absolute identity. In the first place, magnetism is developed in the soft iron of the galvanic magnet by the action of the currents of electricity from the battery, and secondly the armature, rendered magnetic by contact with the poles of the magnet, induces in its turn, currents of electricity in the helix which surrounds it; we have thus as it were electricity converted into magnetism and this magnetism again into electricity.

Another fact was observed which is somewhat interesting in as much as it serves, in some respects, to generalize the phenomena. After the battery had been withdrawn from the acid, and the needle of the galvanometer suffered to come to a state of rest after the resulting deflection, it was again deflected in the same direction by partially detach-

ing the armature from the poles of the magnet to which it continued to adhere from the action of the residual magnetism, and in this way, a series of deflections, all in the same direction, was produced by merely slipping off the armature, by degrees, until the contact was entirely broken. The following extract from the register of the experiments exhibits the relative deflections observed in one experiment of this kind.

Effect Reversed

At the instant of immersion of the battery, deflec. 40° west.

At the instant of immersion of the battery, deflec. 18° east.

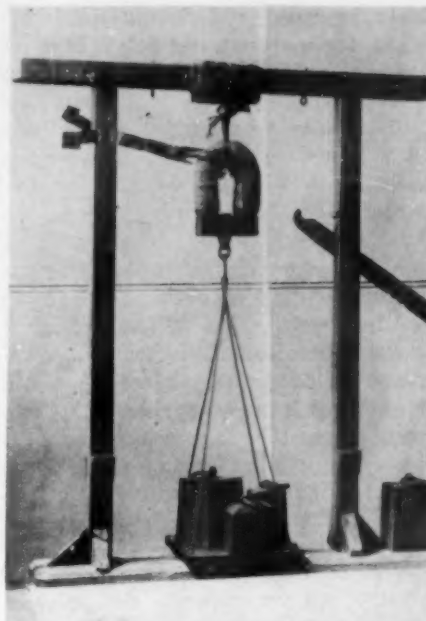
Armature partially detached, deflec. 7° east.

Armature entirely detached, deflec. 12° east.

The effect was reversed in another experiment, in which the needle was turned to the west in a series of deflections by dipping the battery but a small distance into the acid at first and afterwards immersing it by degrees.

From the foregoing facts, it appears that a current of electricity is produced, for an instant, in a helix of copper wire surrounding a piece of soft iron whenever magnetism is induced in the iron; and a current in an opposite direction when the magnetic action ceases; also that an instantaneous current in one or the other direction accompanies every change in the magnetic intensity of the iron.

Since reading the account before given of Mr. Faraday's method of producing electrical currents I have attempted to combine the effects of motion and induction; for this purpose a rod of soft iron ten inches long and one inch and a quarter in diameter, was attached to a common turning lathe, and surrounded with four helices of copper wire in such a manner that it could be suddenly and powerfully magnetized, while in rapid motion, by transmitting galvanic currents through three of the helices; the fourth being connected with the distant galvanometer was intended to transmit the current of induced electricity: all the helices were stationary while the iron rod revolved on its axis within them. From a number of trials in succession, first with the rod in one direction then in the opposite, and next in a state of rest, it was concluded that no perceptible effect was produced on the intensity of the *magneto-electric* current by a rotatory motion of the iron combined with its sudden magnetization.



THE HENRY LIFTING MAGNET

Both Faraday and Henry succeeded in inducing an electric current from magnetism by employing electro-magnets, which Henry had developed to maximum usefulness. This magnet, made by Henry, which lifts 750 pounds, when connected to a small wet battery, is in the U. S. National Museum.

The same apparatus however furnished the means of measuring separately the relative power of motion and induction in producing electrical currents. The iron rod was first magnetized by currents through the helices attached to the battery and while in this state one of its ends was quickly introduced into the helix connected with the galvanometer; the deflection of the needle, in this case, was seven degrees. The end of the rod was next introduced into the same helix while in its natural state and then suddenly magnetized; the deflection, in this instance amounted to thirty degrees, shewing a great superiority in the method of induction.

The next attempt was to increase the *magneto-electric* effect while the magnetic power remained the same, and in this I was more successful. Two iron rods six inches long and one inch in diameter, were each surrounded by two helices and then placed perpendicularly on the face of the armature, and between it and the poles of the magnet so that each rod formed as it were a prolongation of the poles, and to these the armature adhered when the magnet was excited. With this arrangement, a current from one (Please turn page)

helix produced a deflection of thirty-seven degrees; from two helices both on the same rod fifty-two degrees, and from three fifty-nine degrees; but when four helices were used, the deflection was only fifty-five degrees, and when to these were added the helix of smaller wire around the armature, the deflection was no more than thirty degrees. This result may perhaps have been somewhat affected by the want of proper insulation in the several spires of the helices, it however establishes the fact that an increase in the electric current is produced by using at least two or three helices instead of one. The same principle was applied to another arrangement which seems to afford the maximum of electric development from a given magnetic power; in place of the two pieces of iron and the armature used in the last experiments, the poles of the magnet were connected by a single rod of iron, bent into the form of a horse-shoe, and its extremities filed perfectly flat so as to come in perfect contact with the faces of the poles; around the middle of the arch of this horse-shoe, two strands of copper wire were tightly coiled one over the other. A current from one of these

helices deflected the needle one hundred degrees, and when both were used the needle was deflected with such force as to make a complete circuit. But the most surprising effect was produced when instead of passing the current through the long wires to the galvanometer, the opposite ends of the helices were held nearly in contact with each other, and the magnet suddenly excited; in this case a small but vivid spark was seen to pass between the ends of the wires and this effect was repeated as often as the state of intensity of the magnet was changed.

In these experiments the connection of the battery with the wires from the magnet was not formed by soldering, but by two cups of mercury which permitted the galvanic action on the magnet to be instantaneously suspended and the polarity to be changed and recharged without removing the battery from the acid; a succession of vivid sparks was obtained by rapidly interrupting and forming the communication by means of one of these cups; but the greatest effect was produced when the magnetism was entirely destroyed and instantaneously reproduced by a change of polarity.

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COMMERCE

Floods May Increase Sale Of American Goods in China

THE Yangtze River, whose appellation "China's sustenance" has now become singularly ironical, may aid American commerce at the same time it brings sorrow to the area around the city of Hankow. Data at the Far East division in the U. S. Department of Commerce point to the probability of an increased sale in China of United States goods to replace those destroyed there by the recent floods.

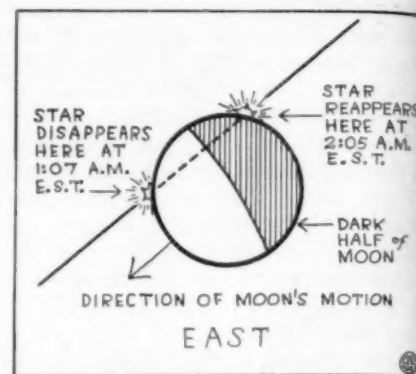
At this time of the year, when American vessels ply the trade route from San Francisco direct to Hankow, there exists a marked need for all kinds of stocks, from flour and other foodstuffs to machinery, from clothing to building materials. Cables to the Department of Commerce say that the majority of the reserve supplies have been lost by the raging waters, making supply from outside necessary and enlarging the market for United States goods.

The flooded Yangtze has made pos-

sible the passage of the large ocean-going steamers, which in low water time unloaded cargo at Shanghai for transshipment by smaller vessels. The city of Shanghai, which because of its proximity to the mouth of Yangtze has been believed by many to be flooded, actually has not been touched by the raging waters, nor is it likely to be. The highest water level has been reached, reports state, and the swollen streams are beginning the long ebb back to normal size.

The Yangtze river, itself, which has done so much damage to Hankow, is the collecting and distributing center of half the commerce of all China. It winds down from the Tibetan plateau across the ridges and plains to the Yellow Sea, a distance of some 3,000 miles. Its drainage area in Szechuen and below is about 650,000 square miles, four-fifths of which lie above Hankow.

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BEHIND THE MOON

As the diagram shows, is where Atlas, or "27 Tauri," was for almost an hour on the morning of Sept. 4.

FROM PAGE 151

and near the northeastern horizon is Capella, in Auriga, the charioteer. Fomalhaut, in Piscis Austrinus, the southern fish, appears low in the south. It is slightly brighter than Deneb, but its proximity to the horizon partially dims it also.

As for the planets, only Saturn is visible in the evening this month. It is in the constellation of Sagittarius, the archer, low in the Southwest, below Aquila. The two eclipses give a good indication of the phases of the moon this month, for a solar eclipse can only occur when the moon is new and a lunar one only when it is full. It is at last quarter, therefore, on September 5, new on the 11th, at first quarter on the 18th and full on the 26th, so that from the middle to the end of the month the evenings will be moonlight.

At 7:24 P. M., on September 23, the sun, having advanced on its southward journey through the sky, crosses the equator. This is the autumnal equinox, and marks the official beginning of autumn.

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LINGUISTICS

Variability in American Speech to be Shown

A LINGUISTIC atlas of the United States is being prepared by the American Council of Learned Societies in Washington.

Language experts headed by Dr. Hans Kurath of the Ohio State University have begun to cross-examine the vocabularies of New England farmers, fishermen, social leaders, laborers, and other groups.

Science News Letter, September 5, 1931

MEDICINE

Common Water Purifier Prevents Ringworm of Feet

A COMMON CHEMICAL used in purifying city water supplies, sodium hypochlorite, has been found to be an effective preventive of ringworm infection of the feet by two workers in medical research, Dr. Earl D. Osborne and Miss Blanche S. Hitchcock, of Buffalo, N. Y. This disease, also known as "athletic foot" and similar nicknames, has spread spectacularly with the post-war rise of sports involving the use of common dressing-rooms and other gathering-places where athletes trample around barefooted for a time. There the spores of the fungi that cause the disease are spread from foot to foot, later causing irritation, cracks and itching watery blisters.

Dr. Osborne and Miss Hitchcock state in their report to the official publication of the American Medical Society that they have not been able to find a record of sodium hypochlorite being used or suggested as a fungus-killer before. They made some preliminary trials with cultures of various fungi in test-tubes, using solutions of the chemical in concentrations stepped up from one thousandth of one per cent. to one half of one per cent. The latter concentration seemed the most effective, and was chosen as standard for a clinical trial.

Solution Renewed

With the cooperation of the physical training department of the Buffalo high schools, heavy rubber pans were installed in all the gymnasiums, and students going to and from gymnasium classes were required to wash their feet in a one-half per cent. solution of sodium hypochlorite. The solution was renewed every day. In a new high school a shallow "well" for the solution was built into the corridor passing from the dressing room to the showers. Later, the strength of the solution was increased to a full one per cent. because of possible dilution through use.

The results of the experiment are reported as most encouraging. The spread of the infection was completely checked.

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PALEONTOLOGY

New Fossils Shed Light On Prehistoric Animal Life

Thousand Rare Specimens, Including Primate Skulls, Are Discovered in Wyoming by Expedition of National Museum

MORE THAN 1,000 specimens of fossilized skeletal remains, study of which will shed new light on animal life 50,000,000 years ago, have been discovered in Wyoming by C. W. Gilmore, curator of paleontology at the National Museum.

Mr. Gilmore has just returned from Big Horn Basin in western Wyoming, where he has been at the head of a Museum expedition engaged in paleontologic exploration.

"We discovered 1,076 specimens, many of which are new to science," he said. "When they are studied, I expect that much new knowledge of mammalian life during the Eocene period will be made available to paleontologists and scientists in general."

Chief among the discoveries are about 600 jaws of various mammals. Included among them are specimens of jaws of horses, primates, cat-like mammals, and other specimens yet to be identified.

These jaws are of very high value scientifically, Mr. Gilmore said. They all belong to mammals of the Eocene period, the time which marks the beginning of modern mammalian life. They will give the museum the first representative collections of such specimens in its history.

First Skeleton for Museum

Unusual among the finds are several parts of *Diatryma*, a huge bird standing nearly six feet tall. Although it is not a new discovery, it is interesting scientifically because it is seldom that any one region is prolific enough to yield more than one part a season.

Parts of four or five *Caryphodons*, the largest mammal of the Eocene period, were discovered. Enough parts were found to construct a complete skeleton, it is believed. This will be the first of its kind ever assembled by the museum, and one of the few in the world. The beasts looked rather like hippopotami.

One of the most exceptional finds

was the complete skeleton of a *Pachyaena*, a cat-like mammal about as big as the largest living tigers. Although parts of this skeleton have been found before, this is the first time a complete formation has come to light.

The complete skull of what appears to be a primate, or member of the ape family, may prove to be the most unusual and valuable find of the entire trip. Mr. Gilmore is not yet certain what type of primate it represents, but he believes there is a possibility that the discovery will prove to be a prize of great scientific value.

The entire collection, totaling more than two tons in weight, is now en route to the museum in 15 large boxes.

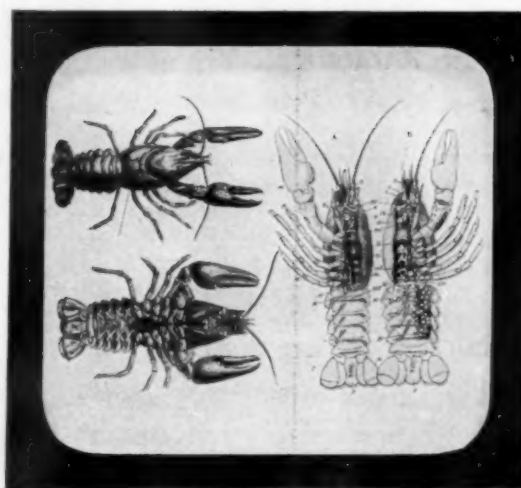
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DIATRYMA

A bird-monster built like a thick-legged ostrich with the head of an enormous hawk. Several fossilized parts of this strange creature were among the finds of the National Museum whose expedition to Wyoming has just returned. Although the discovery is not new, it is scientifically interesting because seldom is one region prolific enough to yield more than one part a season.

LANTERN SLIDES



No. B6621—Slide D7-25

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Tree-Killers

IN YOUR autumn ramblings you may idly kick at a dead tree trunk lying on the ground, and break off a piece; or, perchance, more actively curious, you may tear off a slab of its bark. You will be almost certain to evict from their snug homes one or two little beetles, which on closer examination may be seen to have antennae, or "feelers" quite as long as themselves, and most gracefully ornamented with little bristles or barbs at each joint.

These are members of the numerous clan of beetles known as the Longicornes, or long-horns. They are attractive to look at, as beetles go, but they are as wild and wicked as their name implies. For the long-horns are among the most destructive of all insect pests that attack our trees. There is no grove or forest where their evil work is not known. They prey on growing timber in all corners of the world.

They are evil in their shiny, long-legged adulthood, and in the fat, blunt-headed infancy that precedes it they are more evil still. They chew their way into the wood of the tree, boring long tunnels through and through it and effectually ruining it for lumber. Or, with a taste for juicier fare, they may confine their attention to the living cambium layer, between bark and wood, which gives the tree its growth in girth. Around and around this they go, finally girdling the tree with their remorseless little jaws as effectually as though with an ax; and the tree has nothing left to do but die.

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In a study of physical posture, the U. S. Public Health Service gave physical examinations to 2,200 boys and men, and found that the most striking discovery was the great variability of posture, even in the same individual.

CHEMISTRY

Breakdown of Rubber Found To Be a Process of Oxidation

OXYGEN causes the breakdown of rubber being milled in the course of manufacture. This was brought out in a report by W. F. Busse, Akron, Ohio, before the annual meeting of the American Chemical Society held at Buffalo, N. Y., the week beginning August 31. The action of oxygen on the long molecules of rubber breaks them up into shorter ones and causes the rubber to soften. With the use of a photographic plate the presence of peroxides, the breakdown products of the process, was detected.

The process of oxidation takes place rapidly, especially in cold milling. The rollers have the effect of twisting the minute rubber molecules and making them easier victims of attack by the oxygen. As a check on this oxidation theory, milling was performed in the absence of oxygen. Little, if any, breakdown was said to occur.

At the meeting evidence obtained from the use of the X-ray was presented in regard to the nature of rubber. A report by M. F. Acken, and W. P. Davey, of Pennsylvania State College, called attention to the fact that normal rubber acts like formless matter toward X-rays. When stretched, however, it causes a bending of X-rays as would material composed of fibers, or thread-like cells.

The investigators found that this re-

action to X-rays did not take place as soon as the rubber was stretched, but only after a short time interval in which the so-called fiber structure could be built up. The conclusion was reached that rubber is both a liquid and a solid: fibers with liquid rubber in the spaces between them. This view explained the delay in reaction. Time is required for the liquid to be squeezed out of the spaces, before the molecules of stretched rubber are able to assume the position of true fibers.

Among the reports presented was that of C. R. Park, Charleston, W. Va., and R. B. Maxwell concerning the role of temperature in the vulcanization of rubber. It was pointed out that the temperature of the inside of a rubber article being vulcanized is much lower than that of the outside because rubber compounds do not conduct heat easily. Factors were determined to show accurately how temperature affects vulcanization when certain substances take part in the process.

J. W. Ayers, of Easton, Pa., reported that traces of free ferric sulphate in oxide of iron have shown by experiment to hasten the aging of rubber. Effects of various compounds which speed up the curing of rubber or delay its deterioration were recounted by J. H. Ingmanson, C. W. Scharf, and R. L. Taylor, all of New York City.

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• First Glances at New Books

Aeronautics

A HISTORY OF AIRCRAFT—F. Alexander Magoun and Eric Hodgkins—*McGraw-Hill*, 495 p., \$5. A complete, solidly-written, well-documented history of flying, with both heavier and lighter than air machines, from the earliest hazy legends of Perseus and Daedalus down to Langley, the Wrights, Count Zeppelin and their successors. There is a short but well-selected bibliography, a list of aeronautical and aviation journals, and a chronological summary from 400 B. C. to July 1, 1931 A. D.

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Psychology

A POINT SCALE OF PERFORMANCE TESTS: CLINICAL MANUAL—Grace Arthur—*Commonwealth Fund*, 82 p., \$1.50. Here is made available a standardized scale made up of non-verbal tests well known and commonly used in the clinic, but for which there has been previously no basis of comparison.

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Ethnology

THE NAVAJO INDIANS—Dane Coolidge and Mary Roberts Coolidge—*Houghton Mifflin*, 316 p., \$4. One good way to "get the feeling" of Indian life in America is to become well acquainted with a single tribe. This book offers that sort of acquaintance-ship, and the tribe is a particularly suitable one for the purpose. The Navajos are "the largest and most virile tribe in North America." And at the same time they are steadfastly Indian, in the caliber of their living. The authors have known the Navajos and learned from them, for many years.

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Physics

NEW VIEWS OF SPACE, MATTER AND TIME—J. D. Ross—*Gateway Printing Co., Seattle*, 393 p. \$6.50. Written by an engineer who, after getting himself well informed on modern developments in physics, made experiments to test certain ideas of his own. Presented with a minimum of mathematics.

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Biography-Archaeology

SCHLIEMANN—Emil Ludwig—*Little, Brown*, 297 p., \$3.50. The discoverer of the ruins of ancient Troy has provided Emil Ludwig with fine material for another vigorous biography. It is the story of the grocer's apprentice who fell under the enchantment of

Homer's epic of Troy, and who succeeded finally in linking his name with his beloved Troy as the hero of its nineteenth century epilogue. It is a story full of romance and adventure and Dr. Ludwig gives it to us in vivid style.

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Medicine

SIXTY CENTURIES OF HEALTH AND PHYSICK, THE PROGRESS OF IDEAS FROM PRIMITIVE MAGIC TO MODERN MEDICINE—S. G. Blaxland Stubbs and E. W. Bligh—*Hoerber*, 253 p., \$5. An interesting account of the science of medicine from earliest records to the present. The first half of the book brings us to the beginnings of modern medicine. The plates illustrating a variety of things connected with ancient therapeutics and hygiene are unusually good.

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Mineralogy

TYPICAL ROCKS AND MINERALS IN ILLINOIS—G. E. Ekblaw and D. L. Carroll—*Ill. State Geol. Survey*, 79 p. A well gotten up popular handbook, with plenty of good photographic illustrations.

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Archaeology

EXCAVATIONS AT DURA-EUROPOS—Edited by P. V. C. Baur and M. I. Rostovtzeff—*Yale University Press*, 225 p., 53 plates, \$3. A rich collection of discoveries was made at this ancient city on the Euphrates, during the winter of 1928-29, by the expedition from Yale University and the French Academy of Inscriptions and Letters. This preliminary report takes stock of the season's work, describing and, whenever possible, orienting in Dura's history the new-found ruins, pottery, fabrics, inscriptions, jewelry, paintings and sculptures. Among the important inscriptions is one mentioning the earthquake of 160 A.D., which destroyed the city.

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Psychology

THE MEASUREMENT OF THE INTELLIGENCE OF YOUNG CHILDREN BY AN OBJECT-FITTING TEST—Ruth Ellen Atkins—*University of Minnesota Press*, 89 p., \$1.50. Many mentally normal children are slow to build up a vocabulary. For such young children as well as for the deaf and foreign born the test here described is intended.

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Zoology

OUR WILDERNESS NEIGHBORS—Dorr G. Yeager—*McClurg*, 160 p., \$1.25. The author, who was formerly associate park naturalist in Yellowstone National Park and now holds the same position in Rocky Mountain National Park, writes about the larger mammals of the Yellowstone region with the authority of first-hand experience and observation. Well illustrated with photographic plates, this book is a worthy addition to the gratifyingly increasing literature on the American national parks.

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Psychology

THE FIRST TWO YEARS—Mary M. Shirley—*University of Minnesota Press*, 227 p., \$2. The first of a series of monographs constituting a report of a detailed study of 25 babies. This volume deals with postural and locomotor development. Illustrated with photographs of the infants studied.

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Pets

LITTLE BLACK DOG—Robert Herrick—*Rockwell*, 192 p., \$2. A story for dog lovers, built around a real flesh-and-blood-and-black-hair "Mickey" by a well-known novelist.

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Zoology

PRACTICAL ZOOLOGY—R. W. Hegner—*Macmillan*, 561 p., \$1.80. A successful textbook for high school use, revised to take into account progress in zoology since its first edition in 1915.

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Statistics

RATIO OF CHILDREN TO WOMEN, 1920—Warren S. Thompson—*U. S. Government Printing Office*, 242 p., \$1.50. Showing the trend of population.

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Travel-Natural History

TO THE ENDS OF THE WORLD AND BACK—J. W. McSpadden—*Crowell*, 362 p., \$3. Travel tales of hunters who supply one of our great museums.

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Geography

WORKBOOK TO ACCOMPANY HIGH SCHOOL GEOGRAPHY—R. H. Whitbeck—*Macmillan*, 168 p., 60c. A set of blanks to be filled with geographic knowledge as the student acquires it.

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